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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/023,665	12/21/2001	Tomoyuki Hiroki	35.C16046	6489

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EXAMINER

CULBERT, ROBERTS P

ART UNIT	PAPER NUMBER
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1763

DATE MAILED: 04/02/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/023,665	Applicant(s) HIROKI ET AL.	
	Examiner Roberts Culbert	Art Unit 1763	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 March 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

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DETAILED ACTION

Response to Arguments

Applicant's arguments filed 3/8/04 have been fully considered but they are not persuasive.

Applicant has argued that *"Nothing in Utsunomiya would teach or suggest forming a recessed portion by etching a second surface of a base material of a nozzle member, and then forming nozzle grooves and an opening for communicating the recessed portion with the nozzle grooves by etching a first surface of the base material and the recessed portion, such as are recited in Claim 1."*

The argument is not persuasive because the features upon which applicant relies (i.e., etching...and then forming) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Even if the claims contained the language suggested by applicant, Utsunomiya teaches both a simultaneous etch (Figure 4) and a process in which the etch process for the nozzles is terminated before the etching of the recessed portion is completed (Figure 3). Furthermore one of ordinary skill in the art would have found it obvious at the time of invention to form the recessed portion and the nozzles in subsequent etching steps in order to connect the recessed portion and the nozzles at the desired depth. See Paragraphs 9-13.

Applicant has argued, *"in Utsunomiya a nozzle having a rectangular cross-section cannot be formed with a desired depth. As shown in Utsunomiya's Fig. 4, a nozzle groove having a depth equal to approximately half the thickness of the base material may be formed by Utsunomiya's method (see, e.g., paragraph (0013). In contrast to the method recited in Applicants' Claim 1, Utsunomiya's method does not permit adequate adjustment of the depth of the nozzle groove."*

The argument is not persuasive because Utsunomiya also teaches that the grooves may be formed with a thickness other than half the thickness of the base material. See Figures 1-3 and Paragraphs 8-12.

Applicant has argued, *"In addition, if the cross-section of the nozzle groove is formed to be triangular using Utsunomiya's method, the nozzle grooves cannot be arranged as densely as could*

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nozzle grooves having a rectangular cross-section of the same area, which can be produced according to the method of Claim 1."

The argument is not persuasive because the nozzle grooves of Utsunomiya are formed with a rectangular cross-section. See Figures 5 and 6 for example.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-8 are rejected under 35 U.S.C. 102(b) as being anticipated by Japanese Patent 6-171089 to Utsunomiya.

Regarding claims 1, 3, and 4, and referring to the drawings, Utsunomiya teaches a method for manufacturing a liquid ejecting head, in which liquid flow paths are defined by combining an element substrate (10) having a plurality of discharge energy generating elements (See DERWENT Abstract) for applying discharge energy to liquid with a nozzle member (8) having a plurality of liquid discharge nozzle grooves (1), and an opening (2') communicating with said nozzle grooves, comprising the steps of: preparing at least one material common to said element substrate having a first surface of (110) crystal face orientation, (See Paragraph 13) as a base material of said nozzle member; forming etching mask layers (See Drawing 2) on said first surface of the base material of said nozzle member for forming said nozzle grooves and on a second surface opposite to said first surface, respectively; forming a recessed portion (2) corresponding to said opening (2') in said second surface of the base material by patterning said mask layer on said second surface of the base material and by effecting etching in said second surface and said recessed portion via said mask layer of said second surface; and forming said nozzle grooves (1) in the base material and for communicating said recessed portion with said nozzle grooves by patterning said mask layer on said first surface of the base material and by effecting etching

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via said mask layer of said first surface and said mask layer of said second surface, wherein said nozzle member is a silicon substrate formed to have a surface of (110) crystal face orientation, (See Paragraph 13) and etching for the base material of said nozzle member is anisotropic etching (See paragraph 7, and Drawing 4) directed perpendicular to a surface of the base material, wherein at least one of said mask layers is constituted by a silicon dioxide film (See Paragraph 10). As shown in Drawing 3, an etching amount t of etching for forming said recessed portion satisfies a relationship $t_w > t > t_w - t_n$, when it is assumed that a thickness of said nozzle member is t_w and a depth of said nozzle groove is t_n . Note that Paragraph 12 states that Drawing 3 shows nozzle dimensions, and therefore it may be assumed that the drawing is accurately represented.

Regarding claims 5, 7, and 8, and referring again to the drawings, Utsunomiya further teaches a method for manufacturing a liquid ejecting head, in which liquid flow paths are defined by combining an element substrate (10) having a plurality of discharge energy generating elements (See DERWENT Abstract) for applying discharge energy to liquid with a nozzle member (8) having a plurality of liquid discharge nozzle grooves (1) and a liquid chamber (2') communicating with said nozzle grooves and an opening (2) communicating with said liquid chamber, comprising the steps of: preparing at least one material common to said element substrate having a first surface of (110) crystal face orientation as a base material of said nozzle member; forming etching mask layers (See Drawing 2 for example) on a first surface of the base material of said nozzle member for forming said nozzle grooves and said liquid chamber and on a second surface opposite to said first surface, respectively; forming a recessed portion corresponding to said opening (2) in said second surface of the base material by patterning said mask layer on said second surface of the base material and by effecting etching in said second surface via said mask layer of said second surface; and forming said nozzle grooves (1), said liquid chamber (2'), and said opening (2) in the base material for communicating said recessed portion (2) with said liquid chamber (2') by patterning said mask layer on said first surface of the base material and by effecting etching in said first surface and said recessed portion via said mask layer of said first surface and said mask layer of said second surface, wherein said nozzle member is a silicon substrate formed to have a surface of (110) crystal face orientation, (See Paragraph 13) and etching for the base material of said

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nozzle member is anisotropical etching (See paragraph 7, and Drawing 4) directing perpendicular to a surface of the base material, wherein said mask layer is constituted by a silicon dioxide film (See Paragraph 10). As shown in Drawing 4, an etching amount t of etching for forming said recessed portion satisfies a relationship $t_w > t > t_w - 2 * t_n$ when it is assumed that a thickness of said nozzle member is t_w and a depth of said nozzle groove is t_n . Note that Paragraph 13 states that Drawing 4 shows nozzle dimensions, and therefore it may be assumed that the drawing is accurately represented.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Roberts Culbert whose telephone number is (571) 272-1433. The examiner can normally be reached on Monday-Friday (7:30-4:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory Mills can be reached on (571) 272-1439. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

R. Culbert

R. Culbert

*P. Hassanzadeh
primary Examiner
AU 1763*